



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/534,351	11/07/2005	Ichiro Hayashida	052512	4814

38834 7590 10/01/2008  
WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP  
1250 CONNECTICUT AVENUE, NW  
SUITE 700  
WASHINGTON, DC 20036

EXAMINER
----------

WEBB, GREGORY E

ART UNIT	PAPER NUMBER
----------	--------------

1796

MAIL DATE	DELIVERY MODE
-----------	---------------

10/01/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/534,351

**Applicant(s)**

HAYASHIDA ET AL.

**Examiner**

Gregory E. Webb

**Art Unit**

1796

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 07 November 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SG/US)  
Paper No(s)/Mail Date 0505
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

2. Claims 1-6 are rejected under 35 U.S.C. 102(b) as being anticipated by Okuda (US 4966630)

Concerning the diphosphonic and the ethylenediaminetetraethylenephosphonic, and chelating agent, Okuda, Masaaki teaches the following:

Of the compounds of the above general formulas (I), (II) and (III), the compounds of formula (I) include, among others, nitrilotrismethylenephosphonic acid, nitrilotrisethylenephosphonic acid, nitrilotrispropylenephosphonic acid, nitrilodiethylmethylenephosphonic acid and nitrilopropylbismethylenephosphonic acid; the compounds of formula (II) include, among others, **ethylenediaminetetramethylenephosphonic acid**, **ethylenediaminetetraethylenephosphonic acid** and **ethylenediaminetetrapropylenephosphonic acid**; and the compounds of formula (III) include, among others, methane-1-hydroxy-1,1-diphosphonic acid and ethane-1-hydroxy-1,1-diphosphonic acid. As the salts of such acids, the salts available on partial or complete neutralization with sodium, potassium or ammonium groups may be mentioned. These compounds of formulas (I), (II) and (III) may be used either alone or in combination.

Concerning the boric acid, Okuda, Masaaki teaches the following:

In the anticorrosive pigment composition of this invention comprising said slightly water-soluble condensed phosphate, aluminum stearate- or etidronic acid-modified zinc oxide and **boric acid** compound, the boric acid compound may for example be barium

metaborate, calcium borate, magnesium borate or the like, although barium metaborate is particularly useful. This anticorrosive pigment composition can be produced by mere dry-blending and while the proportions of the components are not particularly critical, the preferred ratio of aluminum dihydrogen triphosphosphate to the above chemically modified zinc oxide is in the range of 20/1 to 1/20 by weight.

3. Claims 1-5, and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Sugihara et al (US 5,302,311).

Concerning the ethylenephosphonic and the intended use, Sugihara, Yasuo teaches the following:

In cleaning a semiconductor substrate with a basic aqueous solution of hydrogen peroxide, it is an object to prevent metal impurities adhering to the substrate surface. A cleaning solution of a semiconductor substrate which comprises a basic aqueous solution of a hydrogen peroxide containing a chelating agent having at least two phosphonic acid groups. Preferred chelating agent is **1,2-propylenediamine tetra(methylene phosphonic acid)** in amount of 1 ppb to 1000 ppm, together with 0.1 to 20% by weight of hydrogen peroxide and, optionally, 0.1 to 10% by weight of ammonia. Even if the cleaning solution is contaminated with metal impurities, characteristics of semiconductor elements prepared from a substrate are stabilized since no metal impurities adhere on the substrate surface.

4. Claims 1-5, and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Nohara et al (US 6,686,322).

Concerning the phosphonic, ethylenephosphonic, and chelating agent, Nohara, Masahiro teaches the following:

3. A cleaning agent according to claim 1, wherein said chelating agent is at least one compound selected from the group consisting of  
**ethylenediaminetetrakis(methylenephosphonic acid),**  
**diethylenetriaminepentamethylenephosphonic acid, 1,2-**  
**propanediaminetetramethylenephosphonic acid.**

Concerning the intended use, Nohara, Masahiro teaches the following:

A cleaning agent which comprises 0.1 to 60% by weight of an oxidizing agent and 0.0001 to 5% by weight of a **chelating agent**. In the process for producing **semiconductor** integrated circuits, a pattern layer of a photoresist used as an etching mask and residues formed from the photoresist by dry etching can be easily removed with the cleaning agent. In the process for producing substrates for liquid crystal display panels, residues derived from a conductive thin film formed by dry etching can also be

easily removed. In the cleaning processes using the cleaning agent, wiring materials or insulating materials in thin film circuit devices or other materials used for producing substrates of **semiconductor** integrated circuits and liquid crystal panels are not corroded.

5. Claims 1-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Abe et al (US 6,323,169).

Concerning the intended use, Abe, Kojiro teaches the following:

Photolithography has been generally employed for the production of semiconductor devices such as IC and LSI. The production of semiconductor devices by photolithography includes sequential steps of forming an insulating film such as a silicon oxide film or a conductive thin film such as a metal film for circuit wirings usually on a substrate such as silicon wafer; uniformly applying a photoresist composition on the film to form a photosensitive layer; forming desired resist patterns by selective exposure of the photosensitive layer to light and development; selectively etching the underlying thin film using the resist pattern as a mask; and then completely removing the resist pattern.

Concerning the phosphonic, ethylenephosphonic, and chelating agent, Abe, Kojiro teaches the following:

6. The aqueous resist stripping composition according to claim 1, wherein said chelating agent is a phosphonic chelating agent, and said phosphonic chelating agent is at least one compound selected from the group consisting of methyldiphosphonic acid, aminotris(methylene-phosphonic) acid, ethylenediphosphonic acid, 1-hydroxyethylidene-1,1-diphosphonic acid, 1-hydroxypropylidene-1,1-diphosphonic acid, ethylaminobis(methylenephosphonic) acid, decylaminobis(methylenephosphonic) acid, nitrilotris(methylene-phosphonic) acid, **ethylenediaminebis(methylenephosphonic) acid**, **ethylenediaminetetrakis(methylenephosphonic) acid**, hexanediaminetetrakis(methylenephosphonic) acid, **diethylenetriamine-pentamethylenephosphonic acid** and **1,2-propanediaminetetramethylenephosphonic acid**.

6. Claims 1-5, and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Takashima (US 20040142835).

Concerning the intended use, Takashima, Masayuki teaches the following:

2. The washing liquid for a semiconductor substrate according to claim 1, wherein the chelating agent is at least one selected from the group consisting of heterocyclic compounds having at least one of a hydroxyl group and a carboxyl group, polyaminocarboxylic acids and a salt thereof, polycarboxylic acids and a salt thereof, compounds having a phosphonic group and a salt thereof, oxycarboxylic acids and a



salt thereof, phenols and tropolones.

Concerning the phosphonic, and ethylenephosphonic, Takashima, Masayuki teaches the following:

[0018] The example of compounds having a **phosphonic** group and a salt thereof includes **ethylenediamine tetramethylenephosphonic acid**, **ethylenediaminedimethylenephosphonic acid**, nitrilotrisethylenephosphonic acid, 1-hydroxyethylidene-1,1-diphosphonic acid, and a salt of these compounds.

Concerning the buffering, Takashima, Masayuki teaches the following:

9. The washing liquid for a semiconductor substrate according to claim 8, wherein the **pH buffering agent** is at least one selected from the group consisting of ammonium hydrogen phthalate, ammonium dihydrogen citrate, ammonium chloride, ammonium citrate, ammonium hydrogen carbonate, ammonium carbonate and ammonium acetate.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregory E. Webb whose telephone number is 571-272-1325. The examiner can normally be reached on 9:00-17:30 (m-f).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harold Pyon can be reached on 571-272-1498. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Gregory E. Webb/  
Primary Examiner, Art Unit 1796

Gregory E. Webb  
Primary Examiner  
Art Unit 1796

gew